

- a) extracting deoxyribonucleic acid from the pathogenic micro-organism;
 - b) identifying at least one gene encoding at least one antigen from the deoxyribonucleic acid, wherein said at least one antigen is capable of stimulating protective immunity against the pathogenic micro-organism;
 - c) inserting the at least one gene into a multicopy plasmid capable of replicating and expressing in the pathogenic micro-organism;
 - d) transforming an attenuated or avirulent strain of the otherwise pathogenic micro-organism with the plasmid to form a vaccine; and
 - e) administering an effective amount of said vaccine to the vertebrate, wherein the pathogenic micro-organism is selected from the group consisting of *Brucella*, *Mycobacterium*, and *Vibrio*.
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Please add the following new claims:

35. (New) A method for immunization, prophylaxis or treatment of a vertebrate at risk of or suffering from a disease caused by a pathogenic micro-organism comprising the steps of:

- a) extracting deoxyribonucleic acid from the pathogenic micro-organism;
- b) identifying at least one gene encoding at least one antigen from the deoxyribonucleic acid wherein said at least one antigen is capable of stimulating protective immunity against the pathogenic micro-organism;
- c) inserting the at least one gene into a multicopy plasmid capable of replicating and expressing in the pathogenic micro-organism;

d) transforming an attenuated or avirulent strain of the otherwise pathogenic micro-organism with the plasmid to form a vaccine; and

e) administering an effective amount of said vaccine to the vertebrate,
wherein the pathogenic micro-organism is *B. abortus* strain RB51.

36. (New) The method of claim 35, wherein the at least one gene is a Cu/Zn SOD gene.

37. (New) The method of claim 35, wherein the at least one gene is one or both of a GroES or a GroEL gene.

38. (~~New~~) A method for immunization, prophylaxis or treatment of a vertebrate at risk of or suffering from a disease caused by a pathogenic micro-organism comprising the steps of:

- a) extracting deoxyribonucleic acid from the pathogenic micro-organism;
- b) identifying at least one gene encoding at least one antigen from the deoxyribonucleic acid wherein said at least one antigen is capable of stimulating protective immunity against the pathogenic micro-organism;
- c) inserting the at least one gene into a multicopy plasmid capable of replicating and expressing in the pathogenic micro-organism;
- d) transforming an attenuated or avirulent strain of the otherwise pathogenic micro-organism with the plasmid to form a vaccine; and

e) administering an effective amount of said vaccine to the vertebrate,
wherein the at least one gene is a Cu/Zn SOD gene.

39. (New) The method of claim 38, wherein said attenuated or avirulent version
of the pathogenic micro-organism further expresses one or more heterologous antigens.

40. (New) The method of claim 38, wherein the pathogenic micro-organism is
selected from the group consisting of *Brucella*, *Mycobacterium*, and *Vibrio*.

41. (New) A method for immunization, prophylaxis or treatment of a vertebrate
at risk of or suffering from a disease caused by a pathogenic micro-organism comprising
the steps of:

- a) extracting deoxyribonucleic acid from the pathogenic micro-organism;
- b) identifying at least one gene encoding at least one antigen from the
deoxyribonucleic acid wherein said at least one antigen is capable of stimulating protective
immunity against the pathogenic micro-organism;
- c) inserting the at least one gene into a multicopy plasmid capable of replicating and
expressing in the pathogenic micro-organism;
- d) transforming an attenuated or avirulent strain of the otherwise pathogenic micro-
organism with the plasmid to form a vaccine; and
- e) administering an effective amount of said vaccine to the vertebrate,
wherein the at least one gene is one or both of a GroES gene and a GroEL gene.

42. (New) The method of claim 41, wherein said attenuated or avirulent version of the pathogenic micro-organism further expresses one or more heterologous antigens.

43. (New) The method of claim 41, wherein the pathogenic micro-organism is selected from the group consisting of *Brucella*, *Mycobacterium*, and *Vibrio*.
